Atty. Docket No.: 3300-Z

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Ben Bacque et al. Group Art Unit 2662

Serial No. 09/199,786 Examiner: Joe Logsdon

Filed: November 25, 1998

For: CONTROLLING ATM LAYER TRANSFER CHARACTERISTICS BASED ON PHYSICAL LAYER DYNAMIC RATE ADAPTATION

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto are three (3) copies of the BRIEF ON APPEAL for the above-identified application.

Also attached is our check in the amount of $330.00 in payment of the brief fee as provided by 37 C.F.R. 1.17(f). Any additional fees necessary to effect the proper and timely filing of this Brief may be charged to Deposit Account No. 26-0090.

Respectfully submitted,

Jim Zegeer

Jim Zegeer, Reg. No. 18,957
Attorney for Appellants

Suite 108
801 North Pitt Street
Alexandria, VA 22314
Telephone: 703-684-8333
Date: October 31, 2003

In the event this paper is deemed not timely filed, the applicant hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 26-0090 along with any other additional fees which may be required with respect to this paper.

OIPE JC176
OCT 3 1 2003
PATENT & TRADEMARK

Atty. Docket No.: 3300-Z

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Ben Bacque et al. — Group Art Unit 2662

Serial No. 09/199,786 — Examiner: Joe Logsdon

Filed: November 25, 1998

For: CONTROLLING ATM LAYER TRANSFER CHARACTERISTICS BASED ON PHYSICAL LAYER DYNAMIC RATE ADAPTATION

BRIEF ON APPEAL

RECEIVED
NOV 0 4 2003
Technology Center 2600

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the final rejection dated May 5, 2003 by the Primary Examiner finally rejecting Claims 1 - 24 of the above-identified application.

I. The Real Party in Interest

The real party in interest is Alcatel Canada Inc.

II. Related Appeals and Interferences

There are no related appeals or interferences.

III. Status of the Claims

Claims 1 - 24 are pending in the application. All claims stand finally rejected.

IV. Status of the Amendments

There was no amendment filed subsequent to the final rejection.

V. Summary of the Invention

The invention is directed to communications service over an asynchronous transfer mode (ATM) network in which the management of data traffic over an end-to-end system includes an ATM layer and a physical layer link having a transfer or transport rate which is subject to variation as a function of time. Specifically, the invention manages the transmission of data traffic by monitoring the physical layer transport rate of the transmission link and sending to a source end point a management cell including rate information based on the measured physical layer transfer rate. Referring to Figures 1 and 2 which are reproduced below for convenience of reference:

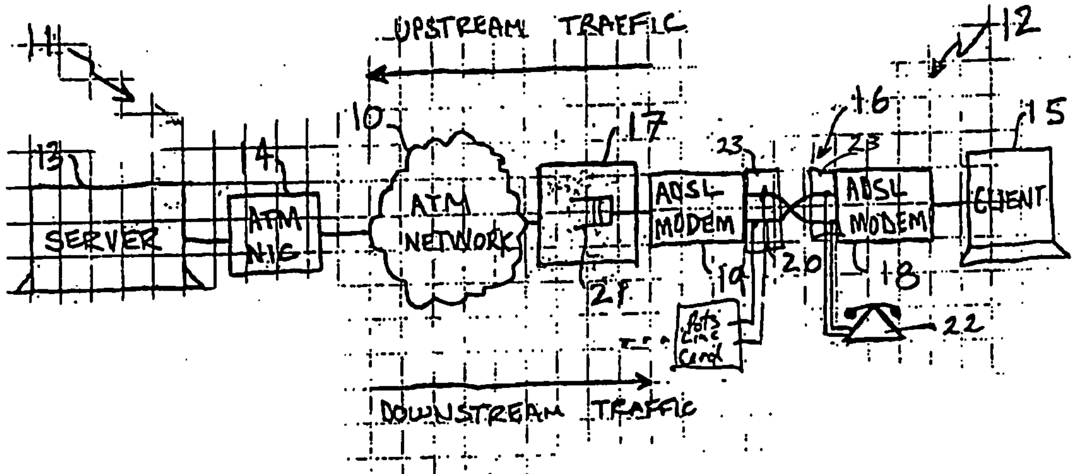

FIG. 1

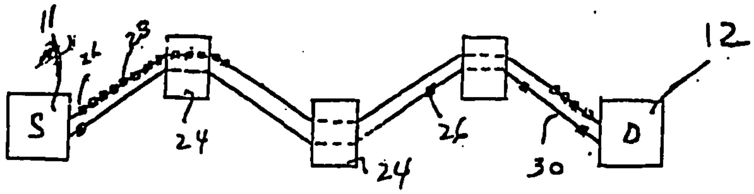

FIGURE 2

The ATM network 10 is coupled to two conventional end systems 11 and 12 which are coupled through an ADSL link 16. The ADSL link 16 is constituted by two ADSL modems 18 and 19. The ADSL link 16 represents a copper loop 20, commonly found in private homes and small businesses.

> It is known that the physical characteristics of ADSL 16 may change with time due to physical conditions of the link, temperature variations or electromagnetic interference. If the physical characteristic of the loop 20 changes such that the peak cell rate carried by the ADSL link is <u>reduced</u> after the connection has been negotiated, ADSL link 16 will not be able to carry all the data traffic sent out from source end-system 11. In this case, buffer 21 will become full and a congestion condition will result. Eventually buffer 21 will overflow resulting in cell traffic discard and loss of continuity."
> (Appellant's specification, page 13, lines 11 *et seq.* Emphasis added.)

The invention solves this problem by monitoring the instantaneous physical layer transport rate of the transmission link and sending to the upstream resource a management message including rate information based on the monitored instantaneous physical layer transport rate and adjusting the upstream source such that the transmission rate is responsive to the rate information in the management message in advance of the onset of congestion and cell loss. Thus, the invention is directed to a system for managing transmission of data traffic through a communication system in which the transmission link has a physical layer transport rate which is subject to variation as a function of time. These physical conditions include actual condition of the loop itself, temperature variations and/or electromagnetic interference.

VI. Issues

1. Was the Examiner correct in rejecting claims 1 and 7 under 35 U.S.C. §102(e) as being anticipated by Meurisse et al (US 5,959,973) (hereinafter "Meurisse")?
2. Was the Examiner correct in rejecting claims 2 - 5, 8, 9, 11, 13 and 22 - 24 under 35 U.S.C. §103 as being unpatentable over Meurisse et al?
3. Was the Examiner correct in rejecting claims 6, 10, 14 and 21 under 35 U.S.C. §103(a) as being unpatentable over Meurisse et al in view of Chang et al (Study of Inoperability between EFCI

and ER Switch Mechanisms for ABR Traffic in an ATM Network) (hereinafter "Chang")?

4. Was the Examiner correct in rejecting claim 12 under 35 U.S.C. §103(a) as being unpatentable over Meurisse et al?

5. Was the Examiner correct in rejecting claims 15 - 20 under 35 U.S.C. §103(a) as being unpatentable over Meurisse et al and Chang et al and further in view of The Admitted Prior Art?

VII. Grouping of Claims

The claims stand or fall together.

VIII. Argument

Issue No. 1.

The Examiner erred in rejecting claims 1 and 7 under 35 U.S.C. §102(e) as being anticipated by Meurisse. The Examiner contends that Meurisse discloses a method and apparatus for controlling the data flow rate of data transmitted over a connection between a source terminal and a destination terminal, which is obviously true. However, the Examiner's attempt to characterize Meurisse's method in appellants' terminology fails. Figure 1 of Meurisse is reproduced as follows for convenience of reference:

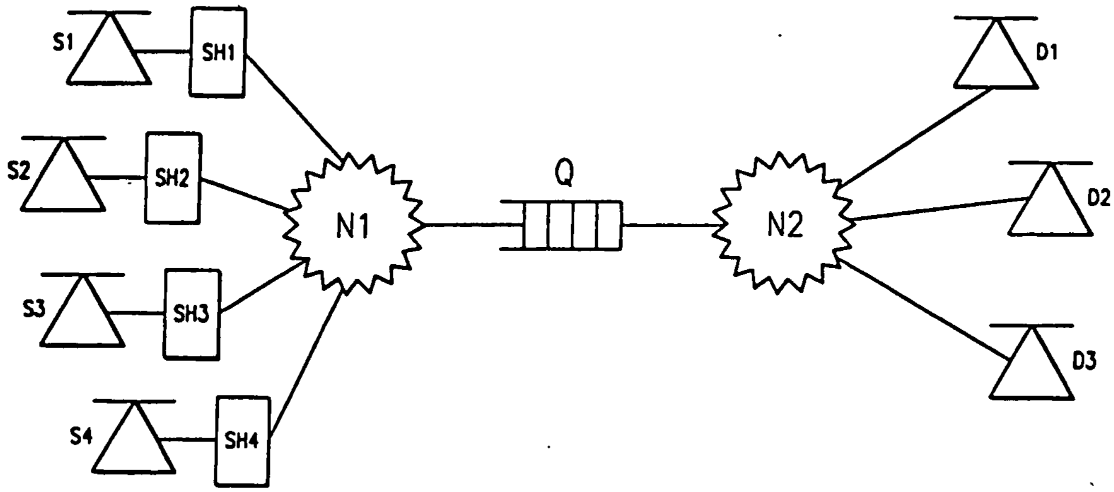

FIG. 1

The problem solved by Meurisse's system is set out at column 1, lines 37 *et seq* as follows:

> More specifically, the queuing points in the known network return two bit codewords to the source nodes when congestion is expected to make these source nodes either decrease, quickly decrease, remain constant or increase their transmit rates. Since it is not checked anywhere in the network how a source node has adapted its transmit rate, the known network relies upon fair behavior of the source nodes. These sources however may increase their transmission rates in a fraudulent way thereby increasing the probability for buffer overflow and data loss in the packet switching network. In a transmission class such as the Available Bit Rate (ABR) class defined by the ATM Forum in the draft Standard with reference ATM Forum\95-0013R10, source nodes are supposed to increase their transmit rates exponentially. If however some of the sources increase their transmit rates stepwise instead of exponentially, queuing points in the network may get overloaded and consequently the network may fail to observe the traffic contracts made up between ABR subscribers and the network operator.

(Emphasis added.)

Thus, Meurisse is dealing with queuing network mode and fraudulent increases in transmission rates by outlaw sources.

The measurements at the queuing network node Q is described in the abstract as follows:

ABSTRACT

As long as a queuing network node (Q) is not congested, it returns to the source terminals (S1, S2, S3, S4) transmitting data packets through this queuing network node (Q), upper packet rate values (ER) which are proportional to the actual packet rate values (CCR). The transmit rate of a source terminal (S1, S2, S3, S4) upon receipt of the upper packet rate value (ER), is controlled so that it stays below this upper packet rate value. In this way, the queuing network node (Q) allows its aggregate input rate to increase in a controlled, smooth way and does not rely on the sources (S1, S2, S3, S4) themselves. Once the queuing network node (Q) gets congested a fair share algorithm is used to determine which source terminals have to decrease their transmit rates and which source terminals are allowed to further increase their transmit rates.

The measurement at the queuing network node Q does not appear to be in any manner, fashion or form affected or influenced by actual conditions of the transmission link itself, temperature variations and/or electromagnetic interference. It is controlled by the transmit rate of the sources. As stated in the abstract, the upper packet rate value (ER) is controlled so that it stays below this upper packet rate value:

> In this way, the queuing network node (Q) allows its aggregate input rate to increase in a controlled, smooth way and does not rely on the sources (S1, S2, S3, S4) themselves. Once the queuing network node (Q) gets congested a fair share algorithm is used to determine which source terminals have to decease their transmit rates and which source terminals are allowed to further increase their transmit rates.

-- no hint whatsoever of any influence of the changes in the physical layer affecting the transport rate of the transmission link.

Clearly, the Examiner's extrapolations regarding Meurisse et al. are not relevant to appellants' invention.

The Examiner makes the statement at the bottom of page 2 and again in the Response to Arguments section on page 9 that: "Every transmission link inherently has a physical layer transport rate that is subject to variations due to actual conditions of the transmission link itself, temperature variations, and/or electromagnetic interference." Although this may well be true, there is nothing in Meurisse et al. that would provide any teaching or suggestion on how to deal with any variation in the physical layer transport rate. Meurisse et al. deals strictly with resource management cells which are transported through the network and are used to measure congestion levels at queuing nodes within the network. There is no teaching or suggestion that the resource management cells carry information relevant to the physical layer transport rate or that they report any abrupt change or interruption in the transport rate.

It is appellants' position therefore that Meurisse <u>does not inherently measure or monitor the instantaneous physical layer transport rate of a transmission link and does not send to an upstream source a management message including the rate information based on the monitored instantaneous physical layer transport rate and adjusting the transmission rate response to the rate information in the management message in advance of the onset of congestion and cell loss as recited in claims 1 and 7</u>.

Issue No. 2.

Claims 2 - 5, 8, 9, 11, 13 and 22-24 were erroneously rejected under 35 U.S.C. §103(a) as being unpatentable over Meurisse et al.

With respect to the rejection of claim 2 under 35 U.S.C. §103(a), the Examiner indicates that Meurisse et al. fails to teach that the management cells are generated in response to changes in measured transport rate above or below the threshold and then concludes that it would have been obvious to one of ordinary skill in the art to modify the teaching of Meurisse et al. so that the management cells are generated in response to changes in measured transport rate above or below a threshold because such an arrangement helps to minimize unnecessary traffic. The Examiner then goes on to say that, when the transport rate is estimated over time intervals of fixed length, such an arrangement allows the effective time delay across the network to be minimized by allowing the destination terminal to estimate, based on the estimated rate

of change of transport rate, the present transport rate at the source terminal. It is not clear where the Examiner gets this allegation, but it seems that if the resource management cells are sent at regular time intervals (see column 5, lines 34 and 35), and if these time intervals are based on a round trip time, i.e. 2 milliseconds (column 6, lines 1 and 2), then a change in the physical layer transport rate would interfere with the round trip time and as a result change the frequency or at least the interval of the RM cells. In the present application, and in particular claim 2, the RM cells are sent or generated in response to a monitored change in the physical layer transport rate and not at a fixed time interval as taught by Meurisse et al.

Regarding the Examiner's comments concerning claims 11 and 13, it will be noted that these claims recite that the instantaneous physical layer transport rate is monitored and the management message contains rate information based on the monitored instantaneous physical transport rate and that the transmission rate responsive to the rate information is contained in the management message in advance of the onset of congestion and cell loss.

The "instantaneous" language is not in claim 13. It has been shown above how it is that Meurisse et al. fails to disclose appellants' method of monitoring the effect of actual conditions of the transmission link itself, temperature variations and electromagnetic interference on the transmission rate. The

Examiner refers to columns 1, 2, 3, 5, 6 and 7 of the Meurisse reference and contends that the "data flow control packet" of Meurisse are the equivalent of appellants' "management cell", and this is not the case. Meurisse's "data flow control packets" contain information regarding the "actual packet rate" of data transmitted over the queuing network connection which is a function of the congested state of the queuing network. It is obviously not the equivalent of appellants' management message which includes rate information based on the monitor transport rate, which message is used to adjust the upstream source transmission rate in response to the rate information in the management message in advance of the onset of congestion and cell loss.

The same goes for claim 13.

Referring to the Examiner's comments concerning claims 22 - 24 that Meurisse fails to teach that the management message is contained in a management cell; the rate information is new rate information; and that the rate information is rate adjustment information. As shown above, Meurisse also fails to teach the measurements of the physical layer transport rate in the manner recited in the parent claims.

Issue No. 3.

Claims 6, 10 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Meurisse in view of Chang. The Chang paper deals with an ATM network which consists of switches using

different rate control mechanisms: "namely, the Explicit Forward Congestion Indication (EFCI) mode and the Explicit Rate (ER) mechanism." As described in column 2 of Chang, an EFCI switch is one that:

> ... when in a congested state, it sets the EFCI bit in the header of all data cells forwarded to its destination. The destination will in turn convey the information back to the source in the RM cell. Also, an EFCI switch may optionally set the congestion bit in the returning RM cell to throttle the source rate. An ER switch is an intelligent switch in that it monitors its traffic and calculates an average fair share of its capacity per active virtual circuit (VC) flow. This quantity is called explicit rate and is given to each active source in its returning RM cells.

Nothing is said in Chang or in Meurisse about monitoring the physical layer transport rate of the physical layer transmission link and recording the value derived therefrom in the RM cell and returning the RM cell including the monitored value to the upstream and adjusting the upstream source's transmission rate in response to the recorded value in the RM cell in advance of the onset of congestion and cell loss. Applicants respectfully submit that the Examiner's extrapolations regarding Meurisse and Chang are based on appellants' teaching and not on what these references teach or suggest one skilled in the art.

Issue No. 4.

The rejection of claim 12 under 35 U.S.C. §103(a) as being unpatentable over Meurisse as applied to claim 11 and further in view of Chang is in error.

Applicants agree that Chang discloses a rate-based flow control mechanism in ATM networks which controls the transmission rate of available bit rate (ABR) traffic sources based on feedback information contained in the resource management (RM) cells coming from the destination and/or network switching nodes. However, Chang does not fill the gap. There is no disclosure of monitoring change in the physical layer.

Issue No. 5.

The rejection of claims 15 - 20 under 35 U.S.C. §103(a) as being unpatentable over Meurisse and Chang as applied to claim 14 further in view of the Admitted Prior Art is in error. Initially, appellants' observe that these claims are patentable for the reasons that the claim from which they depend are patentable, namely, the Examiner has failed to disclose prior art in which the transfer characteristics are controlled based on dynamic adaptation to the physical layer rate variation. In particular, measurement of congestion at a queue point is not measurement of the physical layer transport rate that is subject to variation due to actual conditions such as temperature variations and/or electromagnetic interference. Even if such interference is inherent, the art fails to teach monitoring or measurement of the instantaneous physical layer transport rate and sending to the upstream source a management message including rate information based on the monitored instantaneous physical layer transport rate and adjusting

the upstream source's transmission rate responsive to the rate information in the management message in advance of the onset of congestion and cell loss.

CONCLUSION

In conclusion, the Examiner erred in rejecting claims 1 - 24 and should be reversed.

Respectfully submitted,

Jim Zegeer

Jim Zegeer, Reg. No. 18,957
Attorney for Appellants

Attachment: APPENDIX (Claims on appeal)

Suite 108
801 North Pitt Street
Alexandria, VA 22314
Telephone: 703-684-8333

Date: October 31, 2003

In the event this paper is deemed not timely filed, the applicant hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 26-0090 along with any other additional fees which may be required with respect to this paper.

APPENDIX

1. In a communications system for transporting data traffic downstream from an upstream source over a path which includes a transmission link having a physical layer transport rate which is subject to variations as a function of time due to actual conditions of the transmission link itself, temperature variations and/or electromagnetic interference, a method of managing transmission of the data traffic through the system, the method comprising: the steps of: monitoring the instantaneous physical layer transport rate of said transmission link; sending to said upstream source a management message including rate information based on the monitored instantaneous physical layer transport rate; and adjusting, by said upstream source, said transmission rate responsive to the rate information in said management message in advance of the onset of congestion and cell loss.

2. A method as defined in claim 1 wherein said management message is generated in response to a monitored change in said physical layer transport rate.

3. A method as defined in claim 2 wherein said management message is generated when said change in said physical layer transport rate exceeds a threshold value.

4. A method as defined in claim 3 wherein said management message is generated in response to a decrease in physical layer transport rate in excess of a first threshold value.

5. A method as defined in claim 3 wherein said management message is generated in response to an increase in physical layer transport rate in excess of a second threshold value.

6. A method as defined in claim 1 wherein said traffic is shaped to available bit rate (ABR) category of service traffic

including resource management (RM) cells and said rate information is inserted into said resource management cell.

7. In a communication system for transporting data traffic downstream from an upstream source over a path which includes a transmission link having a physical layer transport rate which is subject to variations as a function of time due to actual conditions of the transmission link itself, temperature variations and/or electromagnetic interference, a system for managing transmission of the data traffic through the system, the system comprising: monitoring means associated with the physical layer to monitor the transport rate of said transmission link; sending means to send to said upstream source a management message including rate information based on the monitored instantaneous physical layer transport rate; and adjusting means, at said upstream source, to adjust said transmission rate responsive to the rate information in said management message in advance of the onset of congestion and cell loss.

8. A system as defined in claim 7 including means to generate said management message in response to a change in the transport rate of said physical layer transmission link.

9. A system as defined in claim 8 including means to compare said change in transport rate with a threshold value and to generate said management message only when said change exceeds said threshold value.

10. A system as defined in claim 9 having shaping means to shape said data traffic to available bit rate (ABR) category of service having resource management (RM) cells periodically carrying explicit rate information in a feedback loop to said upstream source, said system including means to insert said rate information into said RM cells.

11. In a communications system for transporting data traffic downstream from an upstream source over a path which includes a transmission link having a physical layer transport rate which is subject to variations as a function of time due to actual conditions of the transmission link itself, temperature variations and/or electromagnetic interference, a method of managing transmission of the data traffic through the system, the method comprising: continually monitoring the instantaneous physical layer transport rate of said transmission link; generating a management message in response to a change in said monitored physical layer transport rate which exceeds a threshold value, said management message including rate information based on said monitored transport rate; sending to said upstream source said management message; and adjusting said upstream source transmission rate in response to the rate information in the management message in advance of the onset of congestion and cell loss.

12. A method as defined in claim 11 wherein said data traffic is shaped to available bit rate (ABR) category of service having resource management (RM) cells for periodically carrying explicit rate information to said upstream source in a feed back loop said rate information being inserted into said RM cell.

13. In a communications system for transporting data traffic downstream from an upstream source over a path which includes a transmission link having a physical layer transport rate which is subject to variations as a function of time due to actual conditions of the transmission link itself, temperature variations and/or electromagnetic interference, a system for managing transmission of the data traffic through the system, the system comprising: monitoring means for monitoring the physical layer transport rate of said link; generating means to generate a management message in response to a change in said monitored physical layer transport rate which exceeds a threshold value, said management message including information based on said monitored

transport rate; means to send said management message to said upstream source; and adjusting means at said upstream source to adjust said transmission rate in response to the rate information in the management message in advance of the onset of congestion and cell loss.

14. In a communications system for transporting data traffic downstream from an upstream source over a path which includes a transmission link having a physical layer transport rate which is subject to variations as a function of time due to actual conditions of the transmission link itself, temperature variations and/or electromagnetic interference, a method of managing the transmission of data traffic through the system, the method comprising: shaping a data connection from the source to the available bit rate (ABR) category of service, the ABR connection including integrated resource management (RM) cells for carrying congestion information back to said upstream source over a feedback path; monitoring the physical layer transport rate of said physical layer transmission link and recording a value derived from said monitored rate in said RM cell; returning said RM cell including the recorded value to said upstream; and adjusting by the upstream source the transmission rate in response to the recorded value in the RM cell in advance of the onset of congestion and cell loss.

15. A method as defined in claim 14 wherein said transmission link is a digital subscriber loop (xDSL).

16. A method as defined in claim 15 wherein said digital subscriber loop is an asymmetric digital subscriber loop (ADSL).

17. A method as defined in claim 16 wherein data between said upstream source and a downstream destination is bi-directional.

18. A method as defined in claim 17 wherein data between said downstream destination and said upstream source for at least part

of said ATM path is shaped to comply with ATM unspecified bit rate (UBR) category of service.

19. A method as defined in claim 14 wherein said transmission link is a wireless path.

20. A method as defined in claim 14 wherein said transmission link is a path for inverted multiplexing over ATM (IMA).

21. A system for managing data traffic from an upstream source to a downstream destination over an ATM path, the ATM path including a transmission link having a variable physical layer transport rate, said system comprising: shaping means to shape said data traffic connection to comply with ATM available bit rate (ABR) category of service, said ABR connection including an integrated resource management (RM) cell for returning explicit rate (ER) congestion information to said upstream source over a feedback path; monitoring means associated with said transmission link to monitor transport rate capability of said transmission link; recording means to record a rate value derived from said monitored transport rate capability in said RM cell; and control means in said upstream source to adjust the transmission rate of said data traffic in accordance with said transport rate information.

22. The method as defined in claim 1 wherein said management message is contained in a management cell.

23. The method as defined in claim 1 wherein said rate information is new rate information.

24. The method as defined in claim 1 wherein said rate information is rate adjustment information.